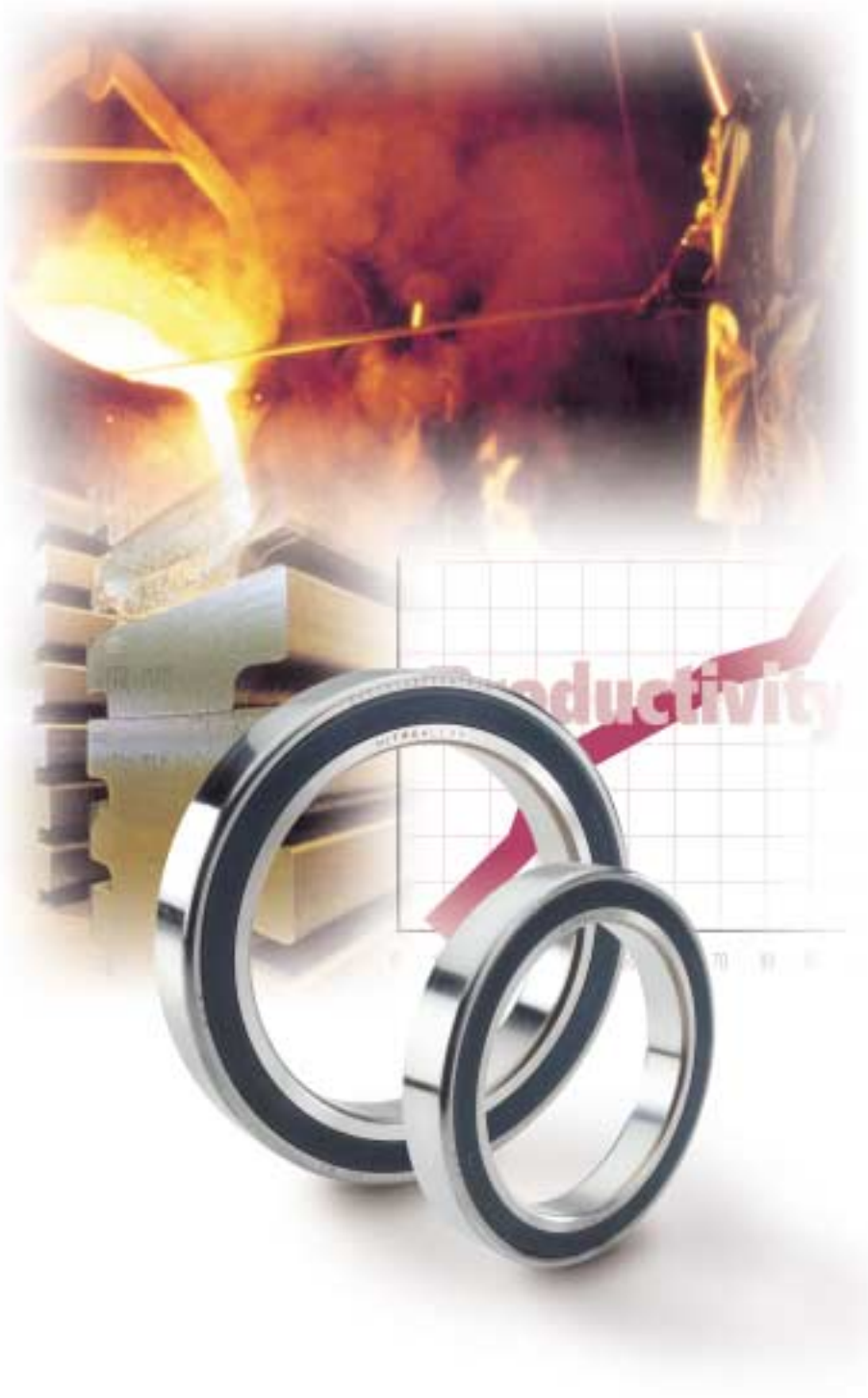
Nitroalloy® series. High precision angular contact ball bearings for ultimate performances



SKF high nitrogen steel bearings with ceramic rolling elements



Achieving better performances

In many industrial fields bearings are more and more often running under severe operational conditions e.g. high speed, critical lubrication and risk of contamination that may severely affect the application service life.

The most common steel, in industry, for high precision bearings is AISI 52100 which, although has proved to be an excellent material, may not fit the extreme applications demands.

SKF's recent research and development activities in the field of materials have led to the introduction of the Nitroalloy® bearings series.

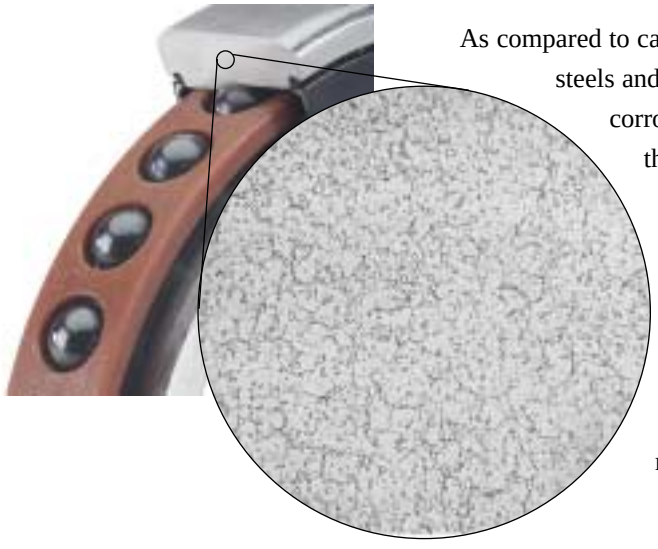
The demand for nitrogen alloyed stainless steel bearings originated from the aerospace industry, where there's no compromise when it comes to performance and reliability.

A superior material setting a new standard

The advantage of nitrogen alloying

A different structure

Nitrogen alloyed steels were selected after several tests made amongst the corrosion resistant materials, as a family of alloys offering superior properties owing to a different micro structure compared to conventional high carbon bearing steel. Nitrogen is a so-called interstitial alloying element and it is well known for its beneficial influence on steel properties.



As compared to carbon, nitrogen is an attractive alloy for corrosion resistant steels and the substitution of carbon with nitrogen leads to improved corrosion resistance properties. In particular, as a consequence of the heat treatment, nitrogen alloyed steels show the precipitation of fine chromium nitrides the size of which is much smaller than the one of chromium carbides.

This fine structure results in longer service life while the much shorter corrosion sensitive chromium denuded zone around the nitrides precipitated, as compared to larger carbides in non nitrogen alloyed martensitic steel, is the mechanism enhancing the resistance to corrosion.

SKF

Applications

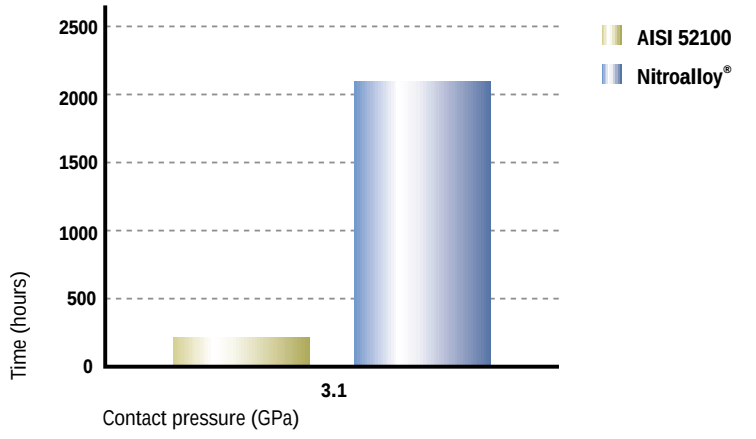
The new Nitroalloy® series is particularly suitable for very demanding applications such as high speed machining centre spindles and high speed milling spindles where the requirements in terms of speed, rigidity and bearings service life are very severe.

The superior corrosion resistance of this series makes the Nitroalloy® bearings the best choice for applications where sealings may not be efficient enough and bearings may be subjected to contamination by coolant or external particles. Furthermore, the reduced thermal expansion of Nitroalloy® material allows a lower preload increase while running at high Nxdm, leading to longer service life and lower temperature rise. SKF's Nitroalloy® series allow a very high wear resistance that, combined with the possibility to tolerate high temperatures, make these bearings suitable to well withstand marginal lubrication conditions.



in high-precision bearings performance

Benefits



Bearing life (AISI 52100 vs Nitroalloy® series)

The new generation of SKF high precision bearings with nitrogen alloyed steel and ceramic rolling elements combines the high resistance to wear, to corrosion and to overrolled contamination particles related to the use of this new steel for rings with the well known advantages of the ceramic rolling elements which can be summarised with low density i.e.less stress generated by centrifugal forces, very low friction enhancing wear resistance and cool running even with poor lubrication , and higher modulus of elasticity making the bearing stiffer.

The superior performance of the Nitroalloy® series has been demonstrated with intensive laboratory tests e.g. rotating beam fatigue test and corrosion resistance test. Field tests indicated the service life of a Nitroalloy® bearing with ceramic rolling elements to be at least 5 times longer than conventional hybrids high precision angular contact ball bearings.

SKF

EUROPE

Austria
SKF Österreich AG
Spindle Service Centre SSC
Phone: + 43 7252 797 729
Fax: + 43 7252 797 732

Czech Republic
SKF Loziska, a.s.
Phone : +420 234642111
Fax : +420 234642415

France
SKF France
Phone: +33 (0) 1 30 12 69 40
Fax: +33 (0) 1 30 12 69 49

Germany
SKF GmbH
Phone: +49 09721 56 0
Fax: +49 09721 56 6000

Italy
SKF LM & PT
Phone: +39 0121 312551
Fax: +39 0121 312550

Denmark, Finland, Norway, Sweden
SKF Multitec AB
Phone: +46 42 253500
Fax: +46 42 253546

Spain
SKF Española, S.A.
Phone: +34 91 768 42 00
Fax: +34 91 768 42 62

Switzerland
SKF LM&PT Switzerland
Phone: +41 1 825 81 81
Fax: +41 1 825 82 82

United Kingdom
SKF Machine Tool Sales UK
Phone: +44 (0) 1582 888888
Fax: +44 (0) 1582 494301

AMERICA

USA
SKF Precision Technologies
Phone: +1 610 861-4800
Fax: +1 610 861 4811

SKF Precision Technologies
Russel T. Gilman
Phone: +1 262 377 2434
Fax : +1 262 377 0413

ASIA

China
SKF China Ltd - Shanghai
Phone: +86 21 5306 8866
Fax : +86 21 5306 5533

Japan
SKF Japan Ltd.
Phone: +81 3-3436-4129
Fax: +81 3-3578-1014

Korea
SKF Korea Ltd.
Phone: +82 (0)51 920-5330
Fax: + 82 (0)51 946-5310

Taiwan
SKF Bearing Services Taiwan Ltd.
Phone: +886 4 2703 3566
Fax: +886 4 2703 3550

The product availability as well as the product application is provided worldwide by international SKF Bearing network. To get any other SKF addresses all over the world, please contact one of the above offices or visit our website SKF.com

www.skf.com

© SKF is a registered trademark of AB SKF
©Copyright SKF 2003

The contents of this publication are the copyright of the publisher and may not be reproduced (even extracts)unless permission is granted Every care has been taken to ensure the accuracy of the information contained in this publication but no liability can be accepted for any loss or damage whether direct,indirect or consequential arising out of the use of the information contained herein. The right is reserved to make changes necessitated by technological developments.

Publication 5343 E

Printed in Italy